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For the Town of Limestone, Maine
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Introduction & History

Trafton Lake is a 131 acre lake which was created in 1971 by Public Law 566 to provide additional spring flood protection. Trafton Lake also serves as a recreational area for the residents of Limestone. The lake's maximum depth is 15 meters (50ft) with an average depth of 5 meters (15 ft). Timberland management areas and several large potato and grain farms surround the lake, making up the majority (95%) of Trafton Lake's watershed and the direct drainage area of 302 acres (Appendix D). The entire 2600 acres of watershed includes some residential (5%), but no houses have developed along the shoreline, only the town's recreation site.

The Maine Department of Environmental Protection (DEP) considers Trafton Lake to be a Non-point Source (NPS) Priority Watershed. It is presently on DEP's list of Quality Limited Lakes (303d list) due to frequent algal blooms. According to Kathy Hoppe, DEP Environmental Specialist, the last year of water-quality data recorded the 15-meter lake had less than 5-ppm oxygen below 4 meters, or nearly 73% of the lake is anoxic. Although the Total Maximum Daily Load (TMDL) is not scheduled until 2008-2011, the DEP may move the date up as a result of local interest.

Purpose

The first step to improving and protecting water quality in Trafton Lake, taken during the month of May 2002, was conducting a study to determine the extent of the problems and the sources of pollutants found throughout the entire watershed of 2600 acres. This report summarizes the findings of the 2002 NPS Watershed Survey of Trafton Lake. The entire watershed was surveyed by Tandy Easler, a consultant hired by the Town of Limestone under EPA's Clean Water Act Section 319 funding (Appendix G). Funding was administered by the DEP.

The purpose of this survey was to identify and prioritize NPS pollution sites in terms of runoff, erosion, nutrient loading and sedimentation. The results will be used to help encourage sustainable, or "best management practices" (BMPs) within the watershed by those who utilize its resources, and to educate interested individuals about the importance of water quality. The Town of Limestone can also use this report to identify problem areas that need attention and as a base in reviewing existing ordinances. They may wish to include additional guidelines for new development, insuring permit applications include stormwater and erosion control plans and that the Planning Board and/or CEO review these plans before issuing a permit to limit the amount of impact new development will have on water-quality. And of course that the CEO inspect these BMPs to be sure they are (1) installed (2) being maintained (3) working as planned.

Participation in the survey itself and in any subsequent implementation of BMPs was and is purely voluntary. The results of this survey could facilitate the development of recommendations in a Watershed Management Plan and accessibility to conservation programs on agricultural land administered through the United States Department of Agriculture (USDA). The eventual implementation of a plan will help protect the incredible resource found in Trafton Lake and the surrounding watershed.

Survey Methods and Materials

While public education is the key to understanding a watershed and how it works, participation by those who reside in that watershed is vital to keeping the lake healthy. In preparing for the survey, letters were delivered to all landowners who own farmland in the direct watershed, announcing the project and asking permission to walk their land (Appendix A). On April 26, 2002 an informal meeting was held at the town office reviewing the purpose of the survey and inviting landowners and residents to become involved in the project. Members of The Limestone Development Foundation (LDF) and their Steering Committee, along with Tandy Easler were available to present the project and answer any questions. It was apparent that many of the landowners in the watershed had talked with a member of the Steering Committee when he delivered the letter to them. These landowners informed him they were all willing to cooperate and gave permission to walk their grounds. With this cooperation between landowners and the LDF, the survey began to develop.

Throughout the month of May, before emerging vegetation had covered the view of bare eroding soil, Tandy Bordner was out in the field identifying sources of nonpoint source pollution to Trafton Lake. She covered the agricultural land that drains directly to the lake with the assistance of Skip Babineau, District Conservationist with the Natural Resource Conservation Service (NRCS), while covering the state roads with the assistance of Mike Cote, Limestone's Public Works Department. Furthermore, Tandy recorded the information on survey forms produced by the DEP (see Appendix B), and documented problems with the aid of a digital camera borrowed from Limestone's Recreation Director. A public meeting is planned for late summer to present the results of this survey.

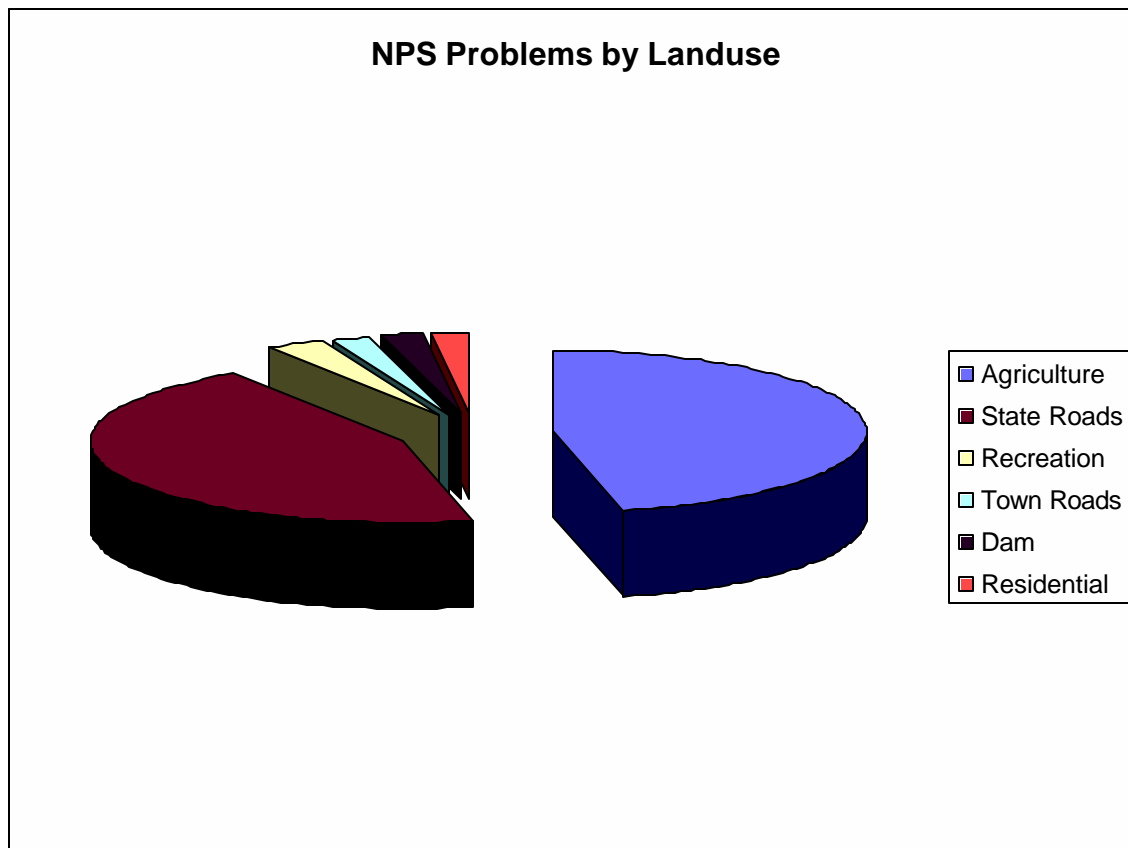
Survey Results

The Trafton Lake Watershed is predominately agriculture, crop land equaling 75% with farm woodlots and wetlands comprising 25%. All but about 2,000 feet of shoreline is partially protected by a riparian buffer. The majority of problems, like the major land use, were found on agricultural lands (Appendix F) and the state roads. There is a direct relationship between the proximity of the lake to the farms, roads and access points. Furthermore, the number of problems noted on residential land are few due to the low population and proximity as well. The closest house is approximately 1,000 feet from the shoreline of the lake, while the farthest house lies approximately 9,000 feet from the shoreline, all located on relatively flat land. Finally, no active logging operations were found within the watershed.

A complete list of sites, the associated problems, recommendations, approximate cost to install recommendations, appropriate program to cost-share problem, and priority status can be found in Appendix E. It is important to note that the cost figures represented here are *roughly estimated*, based on previous projects. It will *roughly* cost \$82,250 to fix all the problems found on agricultural land and *roughly* \$911,113 for the state roads. The cost of solutions to problems within a watershed depends upon several factors. The first factor considered is landowner cooperation. Also, the state of the economy, market value of timber, potatoes and other crops, along with weather conditions, all play a part in the

cost associated with solutions. Technical help for agricultural land may be scheduled through the Central Aroostook Soil and Water Conservation District, 207-764-4770 and through the NRCS office at 207-764-4153 ext. 3. Maine's Local Roads Center with the Department of Transportation (DOT) at 207-287-2152 is available for technical help on roads. These agencies may also be able to provide more accurate cost estimates (Appendix C).

Decisions regarding the reporting of problems may have been grouped or reported separately based on the consultant's judgment in the field. Therefore, a listed site may actually consist of several identical, adjacent problems (for example, several culverts in one stretch of road). On the other hand, associated but distinctly different problems may be listed as separate sites (for example, a road, culvert, and ditch adjacent to each other but listed separately). Therefore, a total number of sites identified and listed is somewhat subjective. In this survey, 126 sites or problems were documented by land use:



- Agriculture =46% of all problems
- State Roads =44%
- Recreation =3%
- Town Roads =2%
- Dam =2%
- Residential =2%

Many of the common, chronically occurring problems were found throughout the watershed and were associated with farm practices and road maintenance. For example, almost every farm within the Trafton Lake Watershed lacks adequate winter cover and conservation tillage. If farmers were to plant a winter cover after harvest, which was left until the following spring, runoff would be greatly reduced. In addition, conservation tillage in the fall after oats or barley harvest would also reduce runoff and decrease siltation. Conservation tillage also leaves some residue on the surface which helps reduce runoff and erosion. Secondly, growing cover crops in the fall are possible depending upon harvest and the cover crop being grown. Winter cover crops incorporate left over nutrients and help build soil organic matter as well.

More chronic problems are associated with maintaining the road system. Every road has the same problems: road shoulder erosion, road sand/salt filling in shoulders and ditches, ditch stormwater capacity exceeded, clogged, crushed and unstable culverts, and poor surface material. Fixing these problems would greatly reduce runoff by holding soil particles in place throughout the drainage system, increasing ditch capacity and decreasing siltation to the lake.

Finally, there was a marked lack of complete buffer zones protecting the lake from erosion and stormwater pollutants off agriculture fields and the recreation area. A complete buffer zone consists of a canopy layer, a bush/shrub layer, a herbaceous layer and a duff layer. Implementing a complete buffer zone dramatically reduces the impact of landuse activities on a lake. For the purpose of this survey, a buffer zone with three out of four components of a true buffer zone qualified as a complete buffer, those with two out of the four components counted as a partial buffer; and those with less than two components qualified as no buffer. The observations and calculation revealed that approximately 1% of the total lots on Trafton Lake are completely buffered, that being undeveloped land. Furthermore, 74% of the total lots are partially buffered, which lies in the developed agricultural land. This is where buffers are needed most due to the amount of soil disturbed or chemically sprayed. Lastly, 25% of the shorefront is not buffered at all, involving more agricultural land and public access or recreational area. An increase in the number of complete buffers would greatly reduce runoff, again, decreasing the amount of siltation to the lake. Where a complete buffer did not occur, evidence of soil movement was apparent throughout streams and in the lake. Throughout the agricultural areas surveyed, some of the buffers are not wide or complete enough to intercept all spring runoff. A general width of 50-200 feet of riparian buffer is recommended between all cropland and the high water mark.

Survey Site Evaluation

In addition to identifying and determining solutions, each site was evaluated for its potential to impact the lake, the technical expertise required to design, install or implement the solution, the cost of the solution and relative priority. The following is a summary of these categories:

Technical Level to Install The level of technical expertise required to design, install, or implement a solution. A 'low' level implies the property owner can accomplish the best

management practice with proper reference materials and/or access to technical advice. A 'medium' level should have a technical person visit the site and make recommendations. Finally, a 'high' level implies the site requires a detailed design. For example, building a grassed waterway requires an engineered design due to the importance of figuring watershed size, water velocity and accounting for those components in the depths and widths of the channel. Many agriculture and road sites require a 'high' level of expertise while many residential sites require a 'low' level.

Impact The potential for the site to contribute pollutants to the lake. A 'low' impact is one in which erosion or runoff has limited transport off site, or it is a small site with no evidence of rills or gullies. A 'medium' impact happens when sediment is transported off site but does not reach a high magnitude of erosion. Finally, 'high' impacts occur on large areas, significantly eroding with direct flow to a stream, ditch or the lake.

Cost An estimate of the cost to design, install or implement the recommended solution. Agricultural costs were estimated in accordance to NRCS standards and specifications. On the same note, road costs were estimated in accordance to DOT standards and specifications. These are rough estimates based on previous watershed survey reports and past projects. The cost of solutions to problems within a watershed depends on several factors like landowner cooperation, economy, market value of timber, potatoes and other crops, along with weather conditions.

Priority This is an assessment of a combination of the potential for impact and the feasibility of implementing a solution. The potential for impact is very important in making this determination. The feasibility assessment is based on cost, technical level, and location of site. This is a professional, yet somewhat subjective determination.

It is extremely important to note that although a few sites warranted a 'priority' ranking, all of the documented sites are significant. The combined effect of several 'small' sites can easily equal that of one 'priority' site. Additionally, it is often the 'low' priority sites that are more easily fixed, especially in the short-run, and fixing several of those sites quickly, can benefit the lake immediately. Any strategy for addressing the problems in a watershed needs to include sites of all priorities.

Survey Recommendations

Since the primary land use activity of land within the Trafton Lake Watershed is agriculture, it appears to be the most pressing issue facing water-quality. Increasing the amount of 'best management practices' used on agricultural land is priority. Three BMP's are recommended on all farms:

- Switching from conventional tillage to conservation tillage would increase surface residue and roughness, decreasing the amount of soil erosion. Chisel plowing, for example, is a less aggressive plowing method that has shown substantial reductions in surface runoff by leaving crop residue and increasing organic matter. Chisel plowing also saves on operational costs and field utilization.

- When harvest timing allows, a winter cover crop should be planted after row crops. An underseeding of Aroostook winter rye, oats, barley, etc. can reduce sheet and rill erosion by 25% or more. Also, brassicas which grow in cooler climates are increasingly being used as cover crops.
- Crop rotation is highly recommended. Most cultivated areas are used primarily for potatoes, broccoli, small grains, and mixed grass and clover hay. It is difficult to determine the actual rotation schedule since it appears to be market driven, but a 1:1 rotation is best for pest management, soil health and water-quality.

Other BMP's above those mentioned are site specific to strip cropping and terraces or diversions on each farm. They include maintaining existing BMP's, mostly on grassed waterways and terraces. Also, extending or establishing vegetative buffers or filter strips. If no vegetative buffer or filter strip exists, then establishing one. If one exists, but isn't wide enough (50-200 feet), then extending the buffer is needed. Either one can be fairly simple like seeding down a piece of cropland and planting balsam fir, black spruce or red pine. In time, this buffer would establish the four components of a vegetative buffer.

Establishing or extending a vegetative buffer is a last line of defense against runoff and holding the lake's shoreline in place. Root systems hold soil particles in place along a shoreline and help reduce erosion from wave action. Not only are vegetative buffers great for filtering runoff and reducing shoreline erosion, but also for deterring geese from grazing the lawn and leaving behind wastes that can also contaminate the lake with bacteria. Geese will not stay and graze where they do not have clear view of the water. This is an apparent problem at the Trafton Lake Recreation Area. More than a thousand feet of shoreline exists un-buffered. The root system attached to grass is not complex enough to hold a shoreline in place. A proper vegetative buffer of a canopy layer, bush/shrub layer, herbaceous layer and a duff layer would intercept any pollutants running off the land, hold the shoreline in place and deter any geese from grazing the area. The Maine DEP has developed a guide titled, "The Buffer Handbook" which is an excellent reference to developing a buffer.

In addition to agricultural land practices and establishing buffers, it is critical that the State of Maine begin maintaining state roads better. Every road has the same problems: road shoulder erosion, road sand/salt filling in shoulders and ditches, ditch capacities becoming exceeded, clogged, crushed and unstable culverts, and poor surface material. The state needs to work with the town of Limestone in pursuing funding possibilities that would cover the costs of maintaining these roads. Public and private roads are crucial to water-quality because they often have direct flow to ditches and streams that lead to the lake. Recommendations are available to the town through the Maine Local Roads Center/Maine DOT, Technical Service Division.

Today, measurable improvements in water-quality are dependant on individual actions. For this reason, the most important next step is to change behaviors. Watershed health must be made a priority before real problems can be fixed. Education, awareness and encouraging people to change the way they do things in order to protect the lake should be a defined task of the Town of Limestone and LDF.

Examples of Typical Problems Identified in Survey

The following pages contain examples of the types of problems found in each land use category and recommend solutions. Many similar sites were identified throughout the survey. An attempt has been made here to choose typical sites without finger-pointing or singling out any particular property. The identity of the properties shown have been screened as much as possible.

AGRICULTURE

Agriculture is the largest land-use in the Trafton Lake Watershed. With agriculture, comes the responsibility of conserving soil and water. Typical problems observed:

- Slight-moderate surface erosion to lake/stream/ditch/wetland
- Lacking winter cover
- Lacking conservation tillage
- Lacking a wide enough vegetative buffer

Problem: The gully here exhibits moderate soil erosion that is transported downhill to Trafton Lake. There was no winter cover planted to hold the soil in place and there is no buffer to intercept any soil or nutrients feeding the lake.



Solution: Plant a winter cover to keep vegetation on the soil through the spring thaw. Utilize conservation tillage to help reduce erosion. Fix drainage problems uphill. This particular site needs many terraces rebuilt above it to combat the movement of the soil. Furthermore, a vegetative buffer needs to be placed as a last line of defense. It would hold the shoreline together and intercept any nutrients washing downhill.

Problem: The problem in the following picture is a grassed waterway that lacks any depth. Waterways are typically built in the depressions of the land where most surface erosion occurs. These vegetated areas act as channels for water to flow. This grassed waterway is no longer doing its job. Water instead, is re-routing along the waterway's edges and eroding the sides where no vegetation exists.



Solution: Rebuild grassed waterway with proper depths, shape and armor to handle water velocities. Maintain a dense and vigorous vegetative growth in waterway and mow on an annual basis. Work-up any bare spots and re-seed as needed. If necessary, at the end of the ten-year life expectancy, contact your local NRCS office for further technical assistance. The soil saved in these grassed waterways can be removed and deposited back on the field where it can be used again to grow crops.

STATE ROADS

With the lack of time and money, the State's maintenance schedule for roads lying in rural Maine remains less than desirable. The four roads that exist in the Trafton Lake Watershed all experience the same problems:

- Lacks regular maintenance
- Slight-moderate road shoulder erosion
- Road sand/salt filling in shoulders and ditches
- Ditch capacities becoming exceeded
- Clogged, crushed and unstable culverts
- Poor surface material

Problem: This picture portrays a number of the problems found with each of the four roads. There is slight road shoulder erosion to the ditch because the sand/salt has filled in the shoulders over the years. There is no longer an adequate grade to allow water into the vegetated ditch that has reached its capacity. Water runs along the side of the road instead, eating away at the pavement and transporting sediment to the streams and wetland that feed Trafton Lake. Where maintenance has occurred, the proper erosion control measures were not taken. Soil has been left bare for water to erode and pick up nutrients along its way to the nearest stream. Furthermore, the poor surface material making up this road is not handling the weight or size of the machinery that utilize the roads.



Solution: Increase maintenance while installing proper erosion controls, such as seed and mulch, silt fences, straw matting, erosion control blanket, rip rap, etc... Remove road sand/salt after winter so that it doesn't fill in shoulders and ditches. Grade shoulders that have been filled in to drain towards ditch. Reshape ditch keeping erosion controls in mind. Add new surface material to road.

Problem: These 36" culverts lack proper armoring and maintenance. Erosion is occurring around these culverts, eating its way toward the road and carrying sediment into the pond that feeds the lake. Cleaning these culverts out isn't as much of a problem with the velocities of water rushing through, but the majority of culverts observed needed cleaned out and even replaced.



Solution: Increase maintenance of culverts, cleaning out debris and looking for problems. Armor the inlet side of these culverts with rip rap so that erosion no longer takes place. This will involve grading and installing erosion control blanket before laying rip rap around culverts.

RECREATION

For the most part, only one area around the lake is used for recreation. This area is owned by the Town of Limestone and is used for summer camping and winter cross-country skiing. Only a couple of problems exist:

- Lack of vegetated buffer along shoreline
- Slight-moderate surface erosion from parking lot to lake
- Slight surface erosion off dirt roads to ditch

Problem: Lack of a vegetated buffer. Although the lawn does keep the soil covered in places, it does not act as a good sediment or nutrient trap; all the natural vegetation has been removed. Not only does this facilitate a high velocity of runoff, but it also disturbs the shoreline. Without roots holding the shore in place, ice and wave action has the opportunity to wash away the shore year after year.



Solution: A vegetated buffer needs to be established in order to stabilize the shoreline, as well as trap sediment and excess amounts of nutrients before reaching the lake. (Note: a soil test is recommended before fertilizing any lawn. Excess amounts of nutrients end up in the lake, not in the lawn. For more information on soil tests, contact the University of Maine Cooperative Extension office at 207-764-3361). Furthermore, a vegetated buffer deters geese from grazing lawns and leaving behind wastes that can add bacteria to Trafton Lake.



Solution: If a natural vegetated buffer is not desirable, a landscaped vegetated buffer can look more like a garden and can keep the view of the lake by planting shorter species.

Problem: Slight-moderate surface erosion is occurring from this parking lot and running down into the lake.



Solution: Add better surface material to prevent erosion, while installing runoff diverters to intercept water and outlet it into a vegetated buffer area.



Summary of Actions That Can Be Taken to Keep Your Lake Healthy

Agriculture

- Utilize Best Management Practices that reduce the amount of soil erosion. Examples include: conservation tillage (chisel plowing), planting a winter cover, strip cropping, cross-slope farming, waterways, sediment basins, terraces, vegetated buffers, crop rotation, etc.
- Have the soil tested before fertilizing. This will save money on unnecessary fertilizers and reduce runoff..
- Maintain wooded land between fields and water bodies. Make sure there is a 50-200 foot strip of vegetation between the field and the water. Also, the more components of a vegetated buffer, the better infiltration of water, sediment and fertilizers.
- When cutting woodlots, make sure everyone is following the forestry guidelines. Have a forest management plan developed that includes road and skid trail management.
- Call your NRCS office or the Central Aroostook Soil and Water Conservation District for technical help and for more information on practices and cost-share programs. (NRCS office @ 764-4153 ext. 3, CASWCD office @ 764-4770)

Forestry

- Work with a licensed forester to develop a forest management plan.

- Proper planning minimizes the potential degradation of water-quality and saves time and money. On topographic maps, soils maps, and aerial photographs identify and mark streams, wetlands, water bodies, steep slopes, flood plains, property boundaries, and harvest area boundaries.
- Walk the area to be harvested and locate truck roads, skidder roads, and trails, cut and fill areas, and stream crossings so that soil disturbance will be minimized. Also, locate sites for landings and borrow pits.
- Timing-Consider winter operations to take advantage of snow conditions and frozen ground; construct bridges and culverts during dry summer months when water flow is low and when fish eggs are not incubating (Oct.-Apr.). Do the construction well ahead of time to allow disturbed soil to stabilize before use.
- Design-Design roads and trails before construction begins. The design must consider grade, width, angle, alignment, surface, drainage, stream crossings, and erosion controls.
- Grade-Keep them shallow except where short, steep sections are required to take advantage of favorable topography and avoid excessive cut and fill.
- Width-Make roads and trails only wide enough to safely accommodate the equipment used on the operation.
- Angle-Consider the soil and rock conditions present; use proper angles for cuts and fills to minimize erosion.
- Alignment-Avoid the toes of slopes, breaks in slope, and running parallel and close to a stream bank.
- Surface-Use crushed rock or gravel where needed to minimize surface washouts.
- Drainage-At regular intervals provide for the passage of surface water from adjacent slopes and roadbeds to the adjacent undisturbed forest floor.
- Stream Crossings-Cross streams at right angles and where approaches are reasonably level for a minimum of 50 feet on both sides. Do not use slash in stream crossings! (NRPA permit needed for crossings. Contact DEP for more information.)
- Erosion Controls-Broad based drainage dips, filter strips, skid humps, water bars, silt fence/straw or hay bales, seeding and re-vegetation, etc...
- Provide for the collection of oils, fuels, coolants, or hazardous wastes during maintenance/repair and for safe disposal of the same through an individual or firm specializing in the disposal of these wastes. Provide absorbent materials for mopping up spills; barrels, drums, etc., to collect waste for later disposal.
- Plan the retirement of roads, trails and landings upon the completion of the operation. Remove all temporary culverts and stream crossings; install water bars, broad based dips, or ditches; smooth and shape road and land surfaces. Permanent culverts must be sized properly and maintained. Protect exposed areas by seeding, mulching and fertilizing as needed. Block roads to prevent unauthorized use after closing.
- There are state and local laws which relate to harvesting operations and water-quality. Make yourself familiar with any Shoreland Zoning, DEP or LURC regulations that might apply. Also, make sure your Forest Operation Notification to the Department of Conservation is in well before construction. If these laws are not obeyed the landowner and harvester are subject to prosecution.

Individuals

- Try not to cut any trees near the lake, streams or wetlands, but if you must, check with the town Code Enforcement Officer before cutting. Shoreland Zoning laws may apply.
- Avoid removal of natural vegetation (trees, shrubs and ground cover). Where they have been removed, replant native species, while letting some or all of your lawn and raked areas revert to natural plants. Stop mowing and raking and the area will revert on its own. Remember, a vegetated buffer is the last line of defense to protect your lake from pollution.
- Reduce the amount of lawn and road surfaces on your property. Lakes like less lawn and less impervious areas (areas where water does not soak into the ground).
- Avoid exposing bare soil. If soil is exposed during construction or due to wear and tear in an area, seed and mulch the area immediately or stabilize with composted bark mulch or stone.
- Stabilize eroding areas on driveways and parking lots with less erodible material and divert water flow off traveled surfaces and into well-vegetated areas to settle.
- Prevent stormwater (from roads, roofs, driveways, parking areas, lawns, construction sites, farmland, etc.) from running directly into drainage swales, streams or the lake. Detain stormwater in depressions or divert the flow to flat, well-vegetated areas where it can settle into the ground.
- Have a soil test done on your lawn before fertilizing. Contact the University of Maine Cooperative Extension, Central Aroostook County Office at 207-764-3361, for a soil sample kit and more information.
- Do not alter the shoreline. Leave existing rocks and vegetation in place. Your lake evolved or developed with these items; removing them is not an improvement, but an alteration of your lake's ecosystem.
- Do not rebuild beaches without state and/or local permits and technical assistance.
- Check sludge levels in your septic tank every year and have it pumped when it is full (every 2-3 years for year-round; 4-5 years for seasonal). Fix faulty systems immediately. Conserve water in and around home. Use natural cleaning products instead of ones with toxic chemicals. Note: garbage disposals are not recommended for septic systems, they require the tank to be pumped more frequently and can shorten the life of your system.
- Support watershed and lake protection efforts. Start a local watershed association.

Municipal Officials

- Carefully review permit applications to insure development occurs in an environmentally-friendly manner.
- Review public policy and ordinances to assure full protection of your lake's watershed, not just the shoreline.

- Make sure all municipal property and facilities are providing a good example of stormwater management (for example, management of roads, right of ways and public access or recreational sites).
- Support and participate in watershed protection projects.
- Provide lake protection and erosion control training for road crews, planning boards, code enforcement officers and conservation commissions.
- Assist in the enforcement of the Erosion and Sedimentation Control Law that requires landowners to properly install and maintain erosion control practices (silt fence, hay bales, seed and mulch) anytime filling or when soil disturbances are conducted.
- Town should find a volunteer lake monitor for Trafton Lake and become involved with the Volunteer Lake Monitoring Program, 207-225-2070.
- Work with USDA/NRCS to make Trafton Lake Watershed a priority for USDA funded practices.

For More Information on Volunteering, or for General Lake Water Quality Resources, Please Contact the Following Groups:

Maine Department of Environmental Protection (MDEP)

Northern Maine Regional Office
1235 Central Drive
Presque Isle, ME 04769
207-764-0477
<http://www.MaineDEP.com>

Limestone Development Foundation (LDF)

93 Main Street
Limestone, ME 04750
207-325-4025

Central Aroostook Soil & Water Conservation District

744 Main Street
Presque Isle, ME 04769
207-764-4770

Natural Resources Conservation Service (NRCS)

99 Fort Fairfield Road
Presque Isle, ME 04769
207-764-4153 ext. 3
<http://www.nrcs.usda.gov/>

Maine Bureau of Forestry

Department of Conservation
State House Station 22
Augusta, ME 04333
207-287-2791

Land Use Regulation Commission (LURC)

State House Station 22
Augusta, ME 04333
207-287-2631

Maine Volunteer Lake Monitoring Program

PO Box 445
Turner, ME 04282
207-225-2070

Maine Local Roads Center

Technical Service Division
Maine DOT
16 State House Station
Augusta, ME 04333
207-287-2152
<http://www.state.me.us/mdot/planning/csd/mlrc.htm>

University of Maine Cooperative Extension

Central Aroostook County Office
57 Houlton Road
Presque Isle, ME 04769

Environmental Protection Agency

<http://www.epa.gov/owow/>

Glossary

Algal Bloom: a growth of algae resulting from excessive nutrients (phosphorous) levels or other physical and chemical conditions that enable algae to reproduce rapidly. The overgrowth of algae can form scums and mats that reduce the amount of oxygen when they decay.

Best Management Practices (BMP's): techniques to reduce sources of polluted runoff and their impacts from construction, agriculture, timber harvesting, residential development and stormwater. BMP's are often a low cost, common sense approach designed to reduce stormwater volumes and velocity, and keep soil out of our lakes and streams. The State of Maine has developed manuals describing these techniques which are available through the Maine DEP.

Nonpoint Source Pollution (NPS): Pollution in the form of an indirect discharge of polluted water, not from a pipe or other specific source, usually as a result of stormwater runoff. Malfunctioning or poorly maintained septic systems may also contribute to NPS.

Phosphorous: An element found throughout the environment; it is a nutrient essential to all living organisms. Phosphorous binds to soil particles, is found in fertilizers, sewage, and motor oil, and is often found in high concentrations in stormwater runoff. The amount of phosphorous present in a lake determines the lake's production of algae. A very small increase in phosphorous levels can grammatically increase algae growth.

Polluted Stormwater Runoff: Runoff that has picked up contaminants or nutrients from the landscape (or air), as it flows over the surface of the land to a waterbody.

Runoff Diverters: A BMP used to intercept and direct surface water runoff.

Broad-Based Dip: Accomplishes the same result as a water bar by using a shallower depression. These devices can be an economical means of getting water to drain off the surface. More appropriate for frequently traveled, year-round roads or driveways, but cannot be used on steep slopes.

Ditch Turnout: Directs ditch water away from road into a vegetated buffer area. The turnout should have a flared section that is level and lined with rock to spread out the flow. Turnouts should be located so that they use the natural contours of the land and should be installed frequently enough to prevent large volumes of runoff from accumulating in ditches.

Rubber Bars: Used to divert water off sloping sections of the road and can take the place of a water bar. The rubber bar protrudes above the road surface high enough to intercept and collect water, while allowing traffic to pass over it. Generally used on seasonal roads or driveways because the bars are prone to snowplow damage.

Water Bars: Used on roads and driveways. It is a constructed ridge (like a speed bump) that runs diagonally across, typically at a 30-degree angle. The ridge stops the water from running down the road or driveway, and diverts it to the side.

Vegetated Buffer: Areas of undisturbed vegetation between a developed area and a waterbody that are used to capture pollutants being transported in surface water, hold the shoreline together with a root system, deter geese from grazing lawns, add privacy and filter noise from motor boats and jet skis. Buffer vegetation can include trees, shrubs, groundcover and a decaying layer, that are planted, transplanted, or growing naturally.

Watershed: The land area which drains surface and ground water to a particular river, stream or body of water. A watershed includes hills, lowlands, and the body of water into which the land drains. Watershed boundaries are defined by the ridges of land separating watersheds. All land is located in a watershed.

List of Appendices

Appendix A -- Letter announcing the project and public meeting

Appendix B – Watershed Survey Field Sheets

Appendix C – Cost Estimates

Appendix D – Trafton Lake Watershed Map

Appendix E – Trafton Lake Watershed Survey Results

Appendix F – Map of Agricultural Sites

Appendix G -- Qualifications

(Appendix A)



**LIMESTONE
DEVELOPMENT
FOUNDATION**

MISSION STATEMENT

To provide a strategic plan that promotes economic growth, complements community development and retains demographic and social traits within the community by the stabilization, expansion and strengthening of our community, economic and industrial development.

93 Main Street

Limestone, Maine 04750

Phone: (207) 325-4025

Fax: (207) 325-3330

To: Landowners

From: Maureen Akerson, Director

Re: Town of Limestone's efforts to improve and protect the water quality of Trafton Lake.

As you know, Trafton Lake is an important economic and recreational area for the town of Limestone. However, over the past few years we have noticed that the lake has been turning green and in general the water quality declining. In an effort to better understand what is happening to the lake, Limestone applied for and received a water quality grant from the Maine DEP.

The grant provides us the opportunity to take the first step to protecting the lake by identifying sources of water pollution. There is no enforcement associated with this effort, quite the contrary. This project will be run similarly to the one we did a few years ago on the Silver Spring Brook Watershed.

To help facilitate the watershed study (the watershed is all the land area that drains to Trafton Lake), Limestone has contracted with Tandy Bordner of Presque Isle to assist us in conducting the watershed survey. Last year Tandy worked with residents of Echo & Hanson Lakes to identify the sources of pollution to those lakes.

Since you own land in the Trafton Lake watershed we would like the chance to work with you to identify potential unstable eroding locations, places where stream crossings or access roads are not stable, and other potential soil or phosphorous contributors. The results of the study will be used to apply for additional grant funds from DEP and possibly obtain funding from USDA for conservation practices.

To learn more about what is planned for this survey and Trafton Lake, we will be holding an informational meeting on April 26, 2002 at 6:30 pm in the Pines Room of the Town Office. We encourage you to attend.

One additional note, we will be contacting you and asking permission to survey your piece of the watershed, we will not enter your property without your permission.

We are very excited at the chance to protect and improve the water quality of Limestone's Trafton Lake, our lake, and hope you are too. We look forward to seeing you.

(Appendix B)

Trafton Lake Watershed Survey Field Sheet

Sector # _____ Date: _____ Surveyor Initials: _____
 Site # _____ Location: _____ Building color: _____
 (house #, road name, # on nearest telephone pole)
 Land owner name: _____
 Tax Map # _____ Tax Lot # _____ Land Owner contacted: yes no
 Picture taken: yes no
 Picture # _____

Land use	Description of Problems		Recommendations (BMPs/fix)		
	Beach Enhancement w/Sand	Roof runoff	Culvert	Road or Driveway	Vegetation
Beach		Soil	Clean out culvert	Add new surface material	Establish buffer
Boat access	Culvert	Bare soil	Enlarge culvert	Build up road	Extend buffer
Commercial	Unstable culvert inlet/outlet	Stockpiled soil	Install plunge pool	Install turnout(s)	Seed and mulch
Driveway	Clogged culvert	Shoreline	Replace culvert	Remove grader berms	Other
Private road	Direct flow of sediment	Erosion	Stabilize inlet and/or outlet	Remove winter sand	Detention basin
State road	To lake	Lack of buffer	Ditch	Reshape or crown	Establish new slope
Town road	To stream	Surface Erosion	Armor with stone or grass	Pave	Infiltration trench
Trail or path	To ditch	Slight	Install ditch	Install runoff diverter(s)	Mulch
Residential lot	Ditch	Moderate	Install turnout	• Broad-based dip	No raking
	Slight erosion	Severe	Reshape	• Open top culvert	Rip rap
	Moderate erosion	Unstable	Erosion Controls (e.g., silt fence)	• Rubber razor	Steps
	Severe erosion	Beach access	Roof Runoff	• Waterbar	Terrace
	Ditch capability exceeded	Boat access	Install stone-filled dripline trench		Runoff diverters
	Pet Waste				(prev. col.)
	Road Shoulder Erosion	Construction site	Install dry well		
	Slight	Other			
	Moderate				
	Severe				

Area Affected (length & width): _____

(Appendix B)

Tech. Level to Install:	High	Medium	Low	None
Impact:	High	Medium	Low	None
Cost:	High	Medium	Low	None

Technical Level to Install Recommended Practices

High: site requires an engineered design

Medium: technical person should visit the site & make recommendations

Low: property owner can accomplish the BMP with proper reference materials and/or access to technical advice

Impact Consider size of impact, slope, amount of soil eroded, proximity to waterbody or buffer

High: large area with significant erosion and direct flow to stream, ditch or lake (e.g., bank or road failure, sediment delta, severe gully and/or rill erosion)

Medium: sediment transported off site but does not reach high magnitude

Low: eroding site with limited transport off site, or small site with no evidence of rills or gullies

Cost

High: greater than \$2,500

Medium: \$501-\$2,500

Low: \$500 or less

(Appendix C)

Cost Estimates

Vegetated Buffer:

Landscaped buffer—materials (mulch and plants) = \$3.15/sq. ft.

Natural buffer—stop mowing and plant a few trees = \$0.00 - \$100.00/acre

Agriculture:

Incentive payment for planting a winter cover crop = \$35.00/acre
(example purposes only)

Incentive payment for Conservation Tillage = \$20.00/acre

Establish/Extend a vegetated buffer on crop land = \$320.00/acre

Build or rebuild a grassed waterway = \$4.00/linear foot

Rip rap within a waterway = \$18.00/linear foot

Rebuild a terrace = \$1.50/linear foot

Recommended sediment basin with rocked inlet and stable outlet = \$8,000.00 each

Run-off diverter, broad based dip crossable by farm equipment = \$400.00 each

Critical area seeding = \$600/acre

State Roads:

Ward Road

Ditching – 4 lane miles 21,120 ft. @ \$7.30 per ft. = \$154,000

Shoulders – 4 lane miles @ \$900 per lane = \$3,600

Paving – 4 lane miles @ 710 ton per mile = \$120,000

Culvert replacements

12-15" X 30' @ \$5.70 per ft. = \$2,052

2-24" X 30' @ \$11.10 per ft. = \$666

1-30" X 30' @ \$13.80 per ft. = \$414

Armor end of 3-36" culverts = \$1,300

\$282,032

(Appendix C)

Cote Road

Ditching – 4 lane miles 21,120 ft. @ \$7.30 per ft.	= \$154,000
Shoulders – 4 lane miles @ \$900 per lane	= \$3,600
Paving – 4 lane miles @ 710 ton per mile	= \$120,000
Culvert replacements	
4-15" X 30' @ \$5.70 per ft.	= \$684
2-18" X 30' @ \$8.30 per ft.	= \$498
1-24" X 30' @ \$11.10 per ft.	= \$333
Armor end of 3-15" culverts	<u>= \$600</u>
	\$279,715

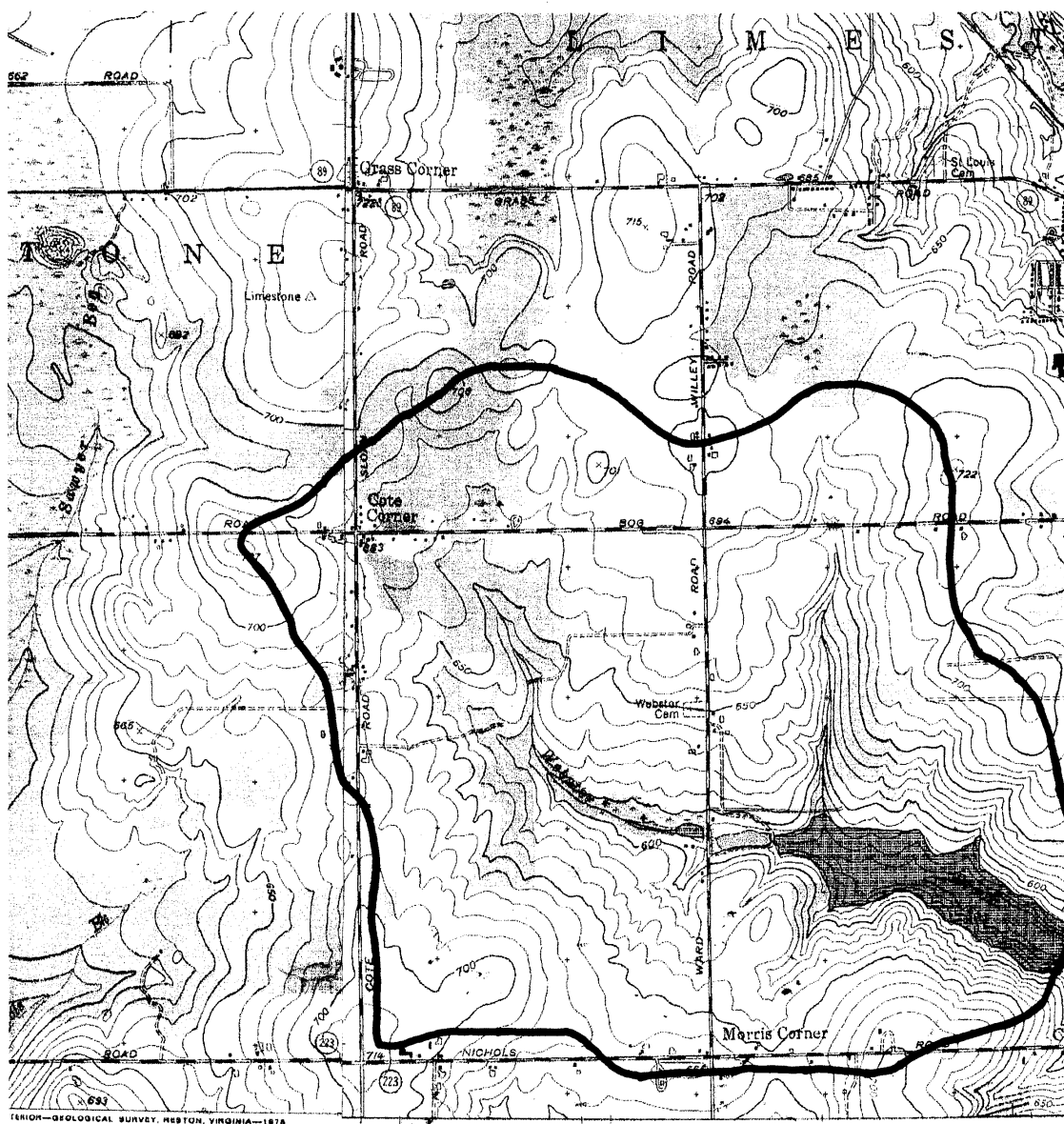
Bog Road

Ditching – 4 lane miles 21,120 ft. @ \$7.30 per ft.	= \$154,000
Shoulders – 4 lane miles @ \$900 per lane	= \$3,600
Paving – 4 lane miles @ 710 ton per mile	= \$120,000
Culvert replacements	
1-15" X 30' @ \$5.70 per ft.	= \$171
1-18" X 30' @ \$8.30 per ft.	= \$249
1-24" X 30' @ \$11.10 per ft.	<u>= \$333</u>
	\$278,353

Noyes Road

Ditching – 1 lane mile 5,280 ft. @ \$7.30 per ft.	= \$39,600
Shoulders – 1 lane mile @ \$900 per lane	= \$900
Paving – 1 lane mile @ 710 ton per mile	= \$30,000
Culvert replacements	
3-15" X 30' @ \$5.70 per ft.	<u>= \$513</u>
	\$71,013

TRAFTON LAKE WATERSHED MAP



A horizontal number line with three tick marks. The first tick mark on the left is labeled 0 . The second tick mark is labeled $24,000$. The third tick mark on the right is labeled $48,000$.

(Appendix E)

Trafton Lake Watershed Survey Results

LAND USE	LOCATION (MAP/LOT#)	TYPE OF PROBLEM	RECOMMENDATIONS	TECH. LEVEL TO INSTALL	IMPACT	ROUGH COST EST.	PROGRAM	PRIORITY
Agriculture (<i>Site 1</i>)	11/1 (field 1) (60 acres)	Moderate surface erosion to lake, lacks winter cover, eroding dock, lack of riparian buffer	Plant winter cover, conservation tillage, rebuild two existing grass waterways, build three more waterways, grade field road to drain into brush while installing a diverter, armor dock, establish buffer, extend existing buffer	High-Low	High	\$8500	Continuous CRP EQIP	High
Agriculture (<i>Site 2</i>)	11/1 (field 2) (35 acres)	Moderate to severe surface erosion to lake, lacks winter cover	Plant winter cover, conservation tillage, either shape and armor existing gullies with stone while establishing a grassed waterway and sediment basin, or armor gullies and establish a larger buffer on the NE end of field, work up and seed bare spots in existing grassed waterway	High-Low	High	\$16,500	Continuous CRP EQIP	High
Agriculture (<i>Site 3</i>)	11/3 (field 1) (7 acres)	Slight surface erosion to lake, lacks winter cover	Install a couple runoff diverters in field road, plant winter cover, conservation tillage	Low	Low	\$1,050	EQIP	Low
Agriculture (<i>Site 4</i>)	10/12 (field 2) (6 acres)	Slight-moderate surface erosion to lake, lacks winter cover	Rebuild terrace, plant winter cover, conservation tillage	High	High	\$800	EQIP	High
Agriculture (<i>Site 5</i>)	10/12 (field 3) (8 acres)	Slight-moderate surface erosion to lake, lacks winter cover	Rebuild terrace, plant winter cover, conservation tillage	High	High	\$875	EQIP	High
Agriculture (<i>Site 6</i>)	10/12 (field 4) (7 acres)	Slight-moderate surface erosion to lake, lacks winter cover	Rebuild terrace, plant winter cover, conservation tillage	High	High	\$850	EQIP	High
Agriculture (<i>Site 7</i>)	10/12 (field 5) (1 acre)	Slight-moderate surface erosion to lake, lacks winter cover	Extend existing buffer, plant winter cover, conservation tillage	Low	Medium	\$150	Continuous CRP EQIP	Medium

(Appendix E)

Trafton Lake Watershed Survey Results

LAND USE	LOCATION (MAP/LOT#)	TYPE OF PROBLEM	RECOMMENDATIONS	TECH. LEVEL TO INSTALL	IMPACT	ROUGH COST EST.	PROGRAM	PRIORITY
Agriculture (Site 8)	10/12 (field 6) (8 acres)	Slight-moderate surface erosion to lake, lacks winter cover	Rebuild terrace, plant winter cover, conservation tillage, extend existing buffer	High	High	\$1,100	EQIP	High
Agriculture (Site 9)	10/12 (field 7) (3 acres)	Slight-moderate surface erosion to lake, lacks winter cover	Rebuild terrace, plant winter cover, conservation tillage, extend existing buffer	High	High	\$800	EQIP	High
Agriculture (Site 10)	10/12 (field 8) (3.5 acres)	Moderate-severe surface erosion to lake, lacks winter cover	Plant winter cover, conservation tillage, establish a riparian buffer	Low	High	\$1,200	EQIP	High
Agriculture (Site 11)	10/12 (field 9) (40 acres)	Slight-moderate surface erosion to lake, lacks winter cover	Rebuild grassed waterway, rebuild terrace, plant winter cover, conservation tillage	High	High	\$4,100	Continuous CRP EQIP	High
Agriculture (Site 12)	10/12 (field 10) (9 acres)	Slight-moderate surface erosion to lake, lacks winter cover	Rebuild grassed waterway, build one grassed waterway, rebuild terrace, plant winter cover, conservation tillage	High	High	\$3,000	Continuous CRP EQIP	High
Agriculture (Site 13)	10/12 (field 11) (11 acres)	Moderate-severe surface erosion to lake, lacks winter cover	Build outlet to planned grassed waterway above, plant winter cover, conservation tillage, establish a riparian buffer	High	High	\$2,000	Continuous CRP EQIP	High
Agriculture (Site 14)	10/13 (field 2) (9 acres)	Slight-moderate surface erosion to lake, lacks winter cover	Rebuild grassed waterway, build one grassed waterway, rebuild terrace, plant winter cover, conservation tillage	High	High	\$3,300	Continuous CRP EQIP	High
Agriculture (Site 15)	10/13 (field 3) (38 acres)	Slight-moderate surface erosion to lake, lacks winter cover	Build one grassed waterway, plant winter cover, conservation tillage	High	Medium	\$2,200	Continuous CRP EQIP	Medium

(Appendix E)

Trafton Lake Watershed Survey Results

LAND USE	LOCATION (MAP/LOT#)	TYPE OF PROBLEM	RECOMMENDATIONS	TECH. LEVEL TO INSTALL	IMPACT	ROUGH COST EST.	PROGRAM	PRIORITY
Agriculture (Site 16)	15/34 (field 3) (9 acres)	Slight-moderate surface erosion to stream, lacks cover	Rebuild grassed waterway, rebuild terrace, plant winter cover, conservation tillage	High	Medium	\$1,800	Continuous CRP EQIP	Medium
Agriculture (Site 17)	15/34 (field 4) (9 acres)	Slight-moderate surface erosion to stream, lacks winter cover	Rebuild grassed waterway, rebuild terrace, plant winter cover, conservation tillage	High	Medium	\$1,825	Continuous CRP EQIP	Medium
Agriculture (Site 18)	15/34 (field 5) (9.5 acres)	Slight-moderate surface erosion to stream, lacks winter cover	Rebuild grassed waterway, rebuild terrace, plant winter cover, conservation tillage	High	Medium	\$1,825	Continuous CRP EQIP	Medium
Agriculture (Site 19)	14/58 (field 4) (36 acres)	Slight-moderate surface erosion to stream, lacks winter cover	Build one grassed waterway, plant winter cover, conservation tillage	High	Medium	\$2,450	Continuous CRP	Medium
Agriculture (Site 20)	14/58 (field 9) (10.5 acres)	Slight surface erosion to stream, lacks winter cover	Extend existing buffer, plant winter cover, conservation tillage	Low	Low	\$675	Continuous CRP	Low
Agriculture (Site 21)	11/ P/O 14-62 (field 1) (48 acres)	Slight-moderate surface erosion to stream, lacks winter cover	Extend existing buffer, plant winter cover, conservation tillage	Low	Medium	\$3,300	Continuous CRP	Medium
Agriculture (Site 22)	11/ P/O 14-62 (field 3) (46.5 acres)	Slight-moderate surface erosion to stream and ditch, lacks winter cover	Extend existing buffer, rebuild grassed waterway if two fields are plowed together, plant winter cover, conservation tillage	High	High	\$3,200	Continuous CRP	High
Agriculture (Site 23)	11/ P/O 14-62 (field 4) (6.5 acres)	Slight surface erosion to ditch, lacks winter cover	Plow East to West, tying both fields together and utilizing grassed waterway, plant winter cover, conservation tillage	Low	Medium	\$225	EQIP	Medium

(Appendix E)

Trafton Lake Watershed Survey Results

LAND USE	LOCATION (MAP/LOT#)	TYPE OF PROBLEM	RECOMMENDATIONS	TECH. LEVEL TO INSTALL	IMPACT	ROUGH COST EST.	PROGRAM	PRIORITY
Agriculture (Site 24)	11/9 (field 5) (30 acres)	Slight-moderate surface erosion to brook/wetland, lacks winter cover	Build one grassed waterway, extend existing buffer on SW edge of field, plant winter cover, conservation tillage	High	Medium	\$2,650	Continuous CRP EQUIP	Medium
Agriculture (Site 25)	11/9 (field 6) (36.5 acres)	Slight-moderate surface erosion and bacteria runoff to brook, lacks winter cover	Build one grassed waterway, extend existing buffer, plant winter cover, conservation tillage	High	Medium	\$2,775	Continuous CRP EQUIP	Medium
Agriculture (Site 26)	11/9 (field 8) (29.5 acres)	Slight-moderate surface erosion to brook /wetland, lacks winter cover	Build two grassed waterways, rebuild one, extend existing buffer, plant winter cover, conservation tillage	High	Medium	\$6,000	Continuous CRP EQUIP	Medium
Agriculture (Site 27)	14/57A (field 1) (75 acres)	Slight-moderate surface erosion to wetland, lacks winter cover	Rebuild two grassed waterways, extend buffer around wetland, plant winter cover, conservation tillage	High	Low	\$8,000	Continuous CRP EQUIP	Low
Agriculture (Site 28)	11/13 (field 8) (23 acres)	Moderate surface erosion to ditch, lacks winter cover	Rebuild section of grassed waterway/field road, plant winter cover, conservation tillage	Low	Medium	\$1,100	Continuous CRP EQUIP	Medium
State Road	Cote Road (2 miles)	Lacks maintenance, slight-moderate road shoulder erosion, road sand/salt filling in shoulders and ditches, ditch capacity becoming exceeded, clogged, crushed and unstable culverts, poor surface material	Increase maintenance, remove road sand/salt after winter, grade shoulders to drain towards ditch, reshape ditches, clean culverts, replace 7 culverts (4-15", 2-18", 1-24"), armor 3 culverts, add new surface material	High	Medium	\$279,715	319 grant	Medium

(Appendix E)

Trafton Lake Watershed Survey Results

LAND USE	LOCATION (MAP/LOT#)	TYPE OF PROBLEM	RECOMMENDATIONS	TECH LEVEL TO INSTALL	IMPACT	ROUGH COST EST.	PROGRAM	PRIORITY
State Road	Ward Road (2 miles)	Lacks maintenance, slight-moderate road shoulder erosion, road sand/salt filling in shoulders and ditches, ditch capacity becoming exceeded, clogged, crushed and unstable culverts, poor surface material	Increase maintenance, remove road sand/salt after winter, grade shoulders to drain towards ditch, reshape ditches, clean out all culverts, replace 15 culverts (12-15", 2-24", 1-30"), armor 3-36" culverts that feed the pond, add new surface material to road	High	High	\$282, 032	319 grant	High
State Road	Bog Road (2 miles)	Lacks maintenance, slight road shoulder erosion, road sand/salt filling in shoulders and ditches, ditch capacity becoming exceeded, clogged and crushed culverts, poor surface material	Increase maintenance, remove road sand/salt after winter, grade shoulders to drain towards ditch, reshape ditches, clean out all culverts, replace 3 culverts (1-24", 1-15", 1-18"), add new surface material to road	High	Medium	\$278, 353	319 grant	Medium
State Road	Nichols Road/ Noyes Road (0.5 mile)	Lacks maintenance, slight road shoulder erosion, road sand/salt filling in shoulders and ditches, ditch capacity becoming exceeded, moderate ditch erosion, clogged, crushed and unstable culverts, poor surface material	Increase maintenance, remove road sand/salt after winter, grade shoulders to drain towards ditch, reshape ditches, clean out one culvert, replace 3-15" culverts, add new surface material to road	High	Medium	\$71, 013	319 grant	Medium

(Appendix E)

Trafton Lake Watershed Survey Results

LAND USE	LOCATION (MAP/LOT#)	TYPE OF PROBLEM	RECOMMENDATIONS	TECH. LEVEL TO INSTALL	IMPACT	ROUGH COST EST	PROGRAM	PRIORITY
Town Road	Trafton Lake Road	Moderate surface erosion in ditch at entrance, unstable outlet at the 48" culvert feeding lake, slight road shoulder erosion, potholes	Reshape ditch at entrance and armor with stone or grass, stabilize culvert outlet with rip rap, add new surface material while crowning section of road with potholes	Low	Medium	\$2,000	319 grant	Medium
Recreation	Trafton Lake Campground	Lacks vegetative buffer, slight-moderate surface erosion from parking lot to lake, slight surface erosion off dirt roads to ditch	Establish vegetative buffer, add new surface material to parking lot while installing runoff diverters, install runoff diverter to dirt road at campground entrance	Low	Medium	\$2,000	319 grant	Medium
Residential	11/6	Lacks vegetative buffer	Establish vegetative buffer-stop mowing	Low	Low	\$0-\$100	319 grant	Low
Residential	11/9B	Lacks vegetative buffer	Establish vegetative buffer-stop mowing	Low	Low	\$0-\$100	319 grant	Low
Dam	Inlet	Structure is falling apart, water is eroding around wooden frame and making an eroded path around dam to the lake	Install a new control riser, stabilize riser with rip rap, stabilize eroded path around dam with shaping and grass	High	High	??	319 grant	High

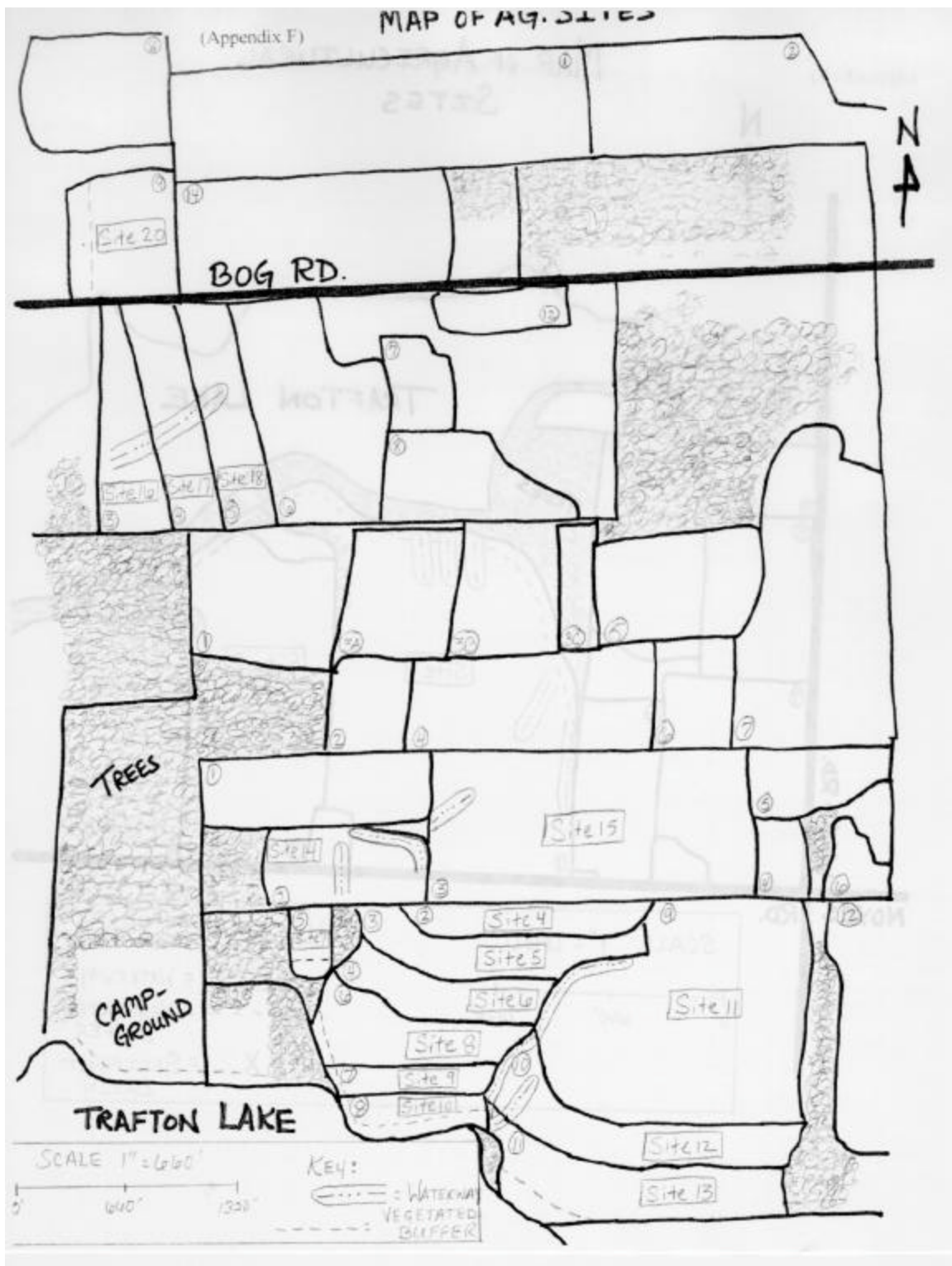
Roughly Estimated Cost to correct all identified problems

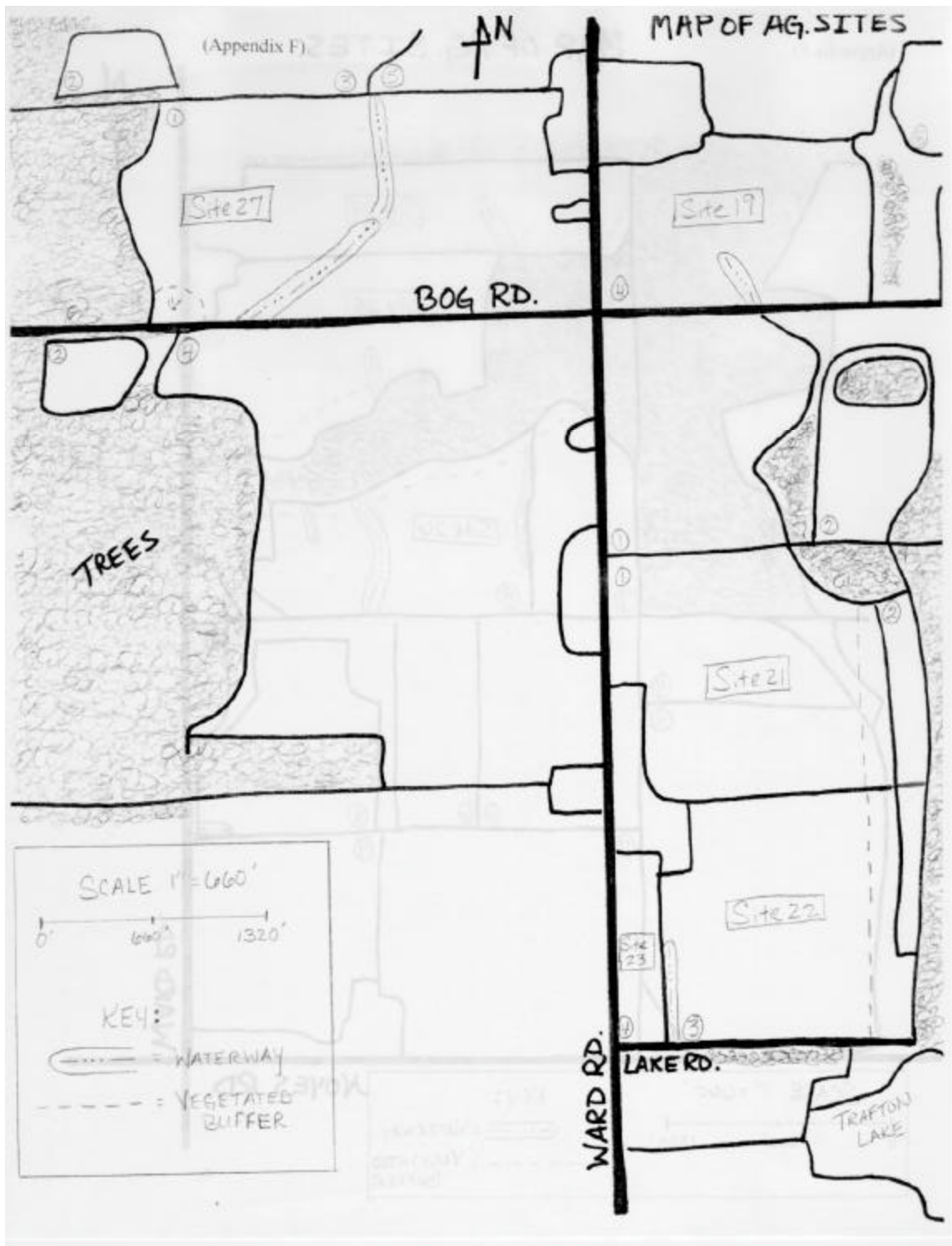
\$995,500

(Appendix F)

MAP OF AGRICULTURAL SITES

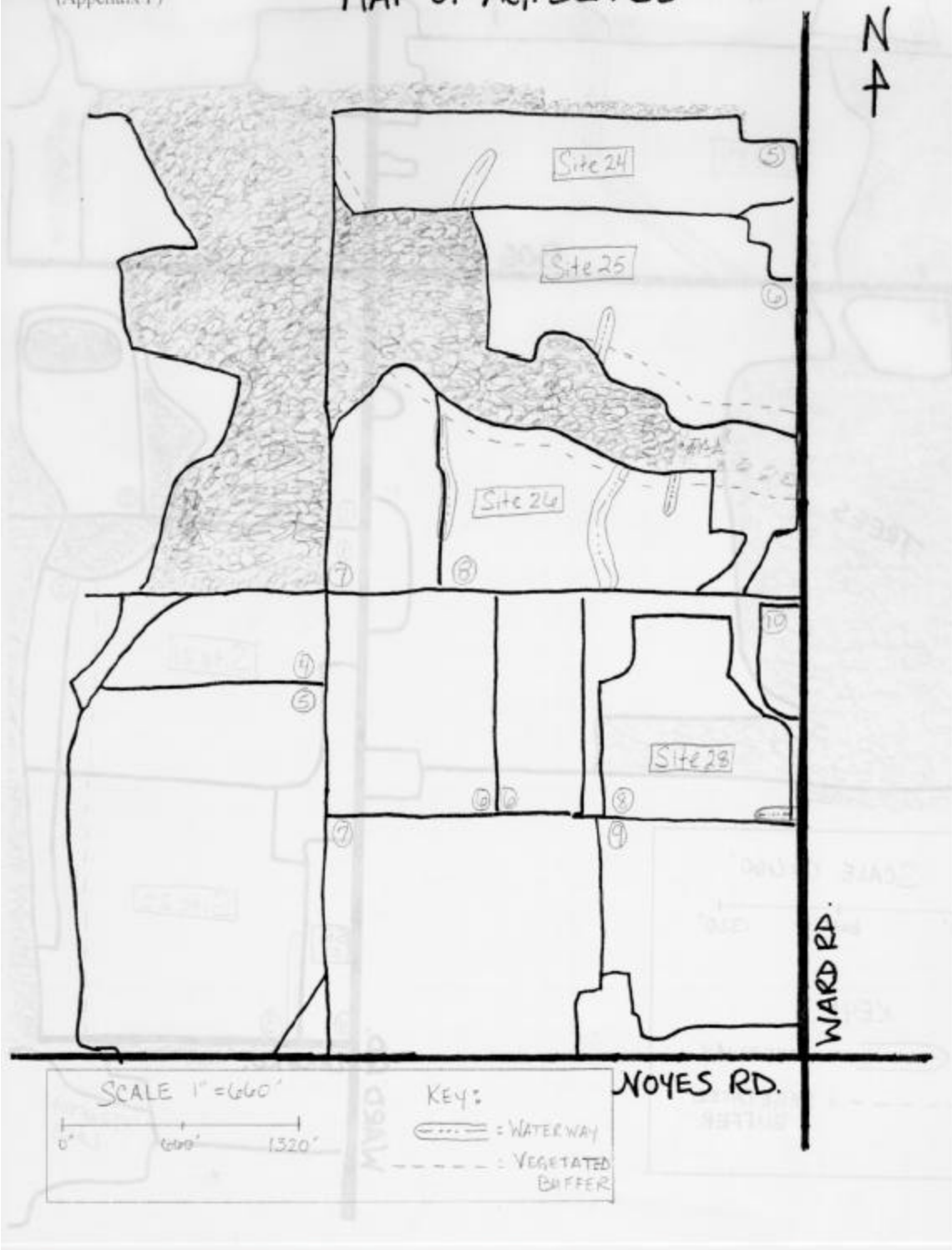






(Appendix F)

MAP OF AG. SITES



(Appendix G)

Qualifications

Tandy Easler
Consultant
375 Puddledock Rd., B
Charleston, ME 04422
207-285-0055
MTeasler@aol.com

Education

1999, *Certificate in Business Foundations*, Indiana University, Bloomington, IN
1998, *Bachelor of Science in Public Affairs*, with a concentration in Environmental Science and Management, Indiana University, Bloomington, IN

Positions Held

Present position, *Watershed Coordinator*
Penobscot County Soil & Water Conservation District, Bangor, ME
Working under a federal 319 grant conducting Watershed Surveys and writing grants to implement BMP recommendations on state, town and private land. Raising awareness of NPS pollution through educational programs given at lake association meetings, conferences, trainings and in the classroom.

1/2001-12/2001, *AmeriCorps Volunteer Leader*
Maine Department of Environmental Protection, Presque Isle, ME
Focused on initiating and implementing Watershed Survey Reports and activating new and existing volunteer groups to take ownership of local watershed, increasing awareness around environmental needs. Delivered environmental education outreach presentations for communities and schools focused on watershed education.

8/1999-12/2000, *Watershed Resource Technician*
Howard County Soil & Water Conservation District, Kokomo, IN
Worked under a federal 319 grant providing technical assistance to landowners for conservation planning, practices and implementation. Delivered conservation education programs and assisted with variety of district projects, meetings and administrative duties under the direction of a Board of Supervisors.